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ABSTRACT

In order to identify and develop procedures for complying with the impact requirements of Public Law 94-482, Project IMPACT studied five problems: (1) how to define impact, (2) how to assess impact, (3) how to show cause and effect relationships between research and development (R&D) activities and changes in the vocational education teaching-learning situation, (4) how to predict the probability of impact, and (5) how to facilitate the impact of R&D activities. The methods used in these studies were to review and discuss views of experts and literature related to the problems and to analyze the process of impact in selected cases of R&D activities and exemplary programs in vocational education in Illinois. This volume provides an overview of Project IMPACT as well as brief synopses of each of the case studies conducted within the two-year project. A summary of the review of literature and the views of experts regarding impact is presented. The final section of the Executive Summary presents a series of generalizations and guidelines for assessing the impact of research and development activities in vocational education. (KC)

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DEVELOPMENT OF PROCEDURES FOR ASSESSING THE IMPACT OF VOCATIONAL EDUCATION RESEARCH AND DEVELOPMENT ON VOCATIONAL EDUCATION (PROJECT IMPACT)

Volume 9 - Executive Summary

STATE BOARD OF EDUCATION
Donald F. Muirheid, Chairman
ILLINOIS OFFICE OF EDUCATION
Joseph M. Cronin, State Superintendent of Education

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DEVELOPMENT OF PROCEDURES FOR ASSESSING THE IMPACT OF VOCATIONAL EDUCATION RESEARCH AND DEVELOPMENT ON VOCATIONAL EDUCATION

STATE BOARD OF EDUCATION
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Department of Adult, Vocational and Technical Education

Springfield, Illinois
August, 1980

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Abstract

In order to identify and develop procedures for complying with the impact requirements of Pubiic Law 94-482, PROJECT IMPACT studied five problems: (1) how to define impact, (2) how to assess impact, (3) how to show cause and effect relationships between research and development (R&D) activities and changes in the vocational education teaching-learning situation, (4) how to predict the probability of impact, and (4) how to facilitate the impact of R & D activities. The methods used in these studies were to review and discuss views of experts and literature related to the problems and to analyze the process of impact in selected cases of R & D activities and exemplary programs in vocational education in Illinois. Findings of PROJECT IMPACT's activities from August 1, 1978 to July 1, 1980 are reported in nine volumes: (1) Context and Principles of Assessing Impact, (2) A Case Study of the Illinois Occupational Curriculum Project, (3) A Case Study of the Illinois Network of Exemplary Occupational Program for Handicapped and Disadvantaged Students, (4) A Case Study of Illinois Projects in Horticulture, (5) A Case Study of Illinois Career Education Projects at the Awareness Level, (6) A Case Study of the Occupational Survival Skills Project, (7) Case Studies of Two Illinois School Districts with Innovative Vocational Education Programs, (8) A Field Study of Predicting Impact of Research and Development Projects in Vocational and Technical Education, and (9) an Executive Summary.

Volume 9 provides an overview of Project Impact as well as brief synopses of each of the case studies conducted within the two-year project. A summary of the review of literature and the views of experts regarding impact is presented. The final section of the Executive Summary presents a series of generalizations and guidelines for assessing the impact of research and development activities in vocational education.

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Marilyn R. Cheney-Stern and L. Allen Phelps
Principals Investigators

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Chapter 1:

Overview of PROJECT IMPACT

In 1974, the U.S. Office of Education (USOE) asked the National Academy of Sciences (NAS) to assess the impact of approximately 250 million dollars spent by USOE on vocational education research and development (R & D) activities during the ten years between 1965 and 1974. The NAS Committee on Vocational Education Research and Development (COVERD 1976) reported that the R & D of the decade studied had impact on curriculum development but did not have documented, widespread impact on the knowledge, skills or employability of large numbers of students. National evaluations of vocational R & D in addition to the COVERD report have been similarly critical (Development Associates, 1975; Rand Corporation, 1975; Comptroller General of the United States, 1974). Acting upon these reports, Congress passed the Educational Amendments of 1976 (Public Law 94-482) which mandated that contracts for R & D in vocational education not be allowable unless the applicant could "demonstrate a reasonable probability that the contract would result in improved teaching techniques or curriculum materials that would be used in a substantial number of classrooms or other learning situations within five years after termination of such contracts" (Federal Register, 1977).

PROJECT IMPACT is a state funded study designed to develop procedures for assessing the impact of vocational education research and development efforts on vocational education. The

primary purpose of the study is to identify and develop procedures for complying with the impact requirement of Public Law 94-482.

The study addresses itself to three problem areas: (1) how to define impact, (2) how to assess impact, and (3) how to show a cause-and-effect relationship between project activities and changes in the vocational education teaching-learning situations. The study also addressed two subsidiary problems: (1) how to predict the probability of impact and (2) how to manage on-going contracts to increase impact probability.

The methods used to conduct this study were to review literature related to the problem areas, to interview individuals with experience and expertise in the problem areas, and to analyze the process of impact of several programs of related projects which were funded by the Illinois Office of Education/Department of Adult, Vocational and Technical Education/Research and Development Section and one project funded by the Comprehensive Employment and Training Act (CETA).

The major activity of PROJECT IMPACT has been to analyze the programs (cases) of related R & D projects. For the first year, it was decided to select two cases for "top-down" analysis and two cases for "bottom-up" analysis (see Volume 1, Appendix A, p. 43). The project staff referred to these types of retrospective analysis as "tracking." It was anticipated that the two types of tracking would produce different insights about impact. For example, bottom-up tracking might better identify "bottlenecks" to impact than would top-down tracking while top-down

tracking might be more effective in relating project intents and project outcomes. One staff member was assigned as "tracking manager" for each of the four cases and was instructed to keep a detailed log of her/his activiites (e.g., identifying documents, retrieving documents, identifying key people and interviewing them, recording data, analyzing data).

Nominations for the first four case studies were sought from members of PROJECT IMPACT's Advisory Committee, project consultants, and project staff members. The following cases were selected for top-down tracking:

1. "A Research and Development Project in Occupational Education" (The Illinois Occupational Curriculum Project --I.O.C.P.) which was developed by Joliet Junior College and funded by them and by the Illinois Department of Adult, Vocational and Technical Education in fiscal years 1970-72.
2. "The Illinois Network of Exemplary Occupational Programs for Handicapped and Disadvantaged Students." At the time the case study was intiated, the network was in its fourth year of operation. It was in the "dissemination" stage and IOE/ DAVTE had funded Illinois State University to coordinate dissemination for the Network's eight demonstration projects.

The third and fourth cases, which were selected for bottom-up tracking, were:

3. "Illinois Projects in Horticulture." IOE/DAVTE funded some twelve R & D projects in horticulture between 1967

and 1978. Both private and public schools participated in these R & D efforts.

4. "Illinois Career Education Projects at the Awareness Level." IOE/DAVTE funded three or more major projects in this area between 1970 and 1978, and CETA began funding one for the Illinois Department of Corrections in 1975.

During its second year PROJECT IMPACT studied the "Occupational Survival Skills Project" and "Two Illinois School Districts with Innovative Vocational Education Programs" and developed a model for an "Impact Assessment System for the Illinos Board of Education/Division of Adult, Vocational and Technical Education/ Research and Development Section."

PROJECT IMPACT's activities for the 1979 and 1980 fiscal years are reported in nine volumes. Volume 1--Context and Principles of Assessing Impact--contains an introduction to PROJECT IMPACT, a review of literature and views of experts in regard to planned educational change and impact, the methods used to conduct impact case studies, a concise listing of references used during Phase 1 activities, and appended materials such as the initial project proposal and data collection instruments which were developed for use in case studies. Supplemental reports of the project are contained in the following volumes:

Volume 2 -- A Case Study of the "Illinois Occupational Curriculum Project"

Volume 3 -- A Case Study of the "Illinois Network of Exemplary Occupational Programs for Handicapped and Disadvantaged Students"

Volume 4 -- A Case Study of "Illinois Projects in Horticulture"

Volume 5 -- A Case Study of "Illinois Career Education Projects at the Awareness Level"

Volume 6 -- A Case Study of the "Occupational Survival Skills Project"

Volume 7 -- Case Studies of "Two Illinois School Districts with Innovative Vocational Education Programs"

Volume 8 -- A Field Study of "Predicting Impact of Research and Development Projects in Vocational and Technical Education"

Volume 9 -- Executive Summary of Volumes 1-8 and Conclusions and Recommendations for Assessing the Impact of Vocational Education Research and Development on Vocational Education

Chapter 2:

Summary of the Views of Experts and the Review of Literature

In the fall months of 1978, PROJECT IMPACT's staff held several meetings with experts in problems related to assessing impact on social systems and conducted a review of literature on planned change, impact assessment and case study methodology. A summary of the ideas gained from these activities follows and is divided into three major sections: Planned Change, Impact Assessment and Case Study Methodology. It should be pointed out that these efforts were intended to serve as a springboard to the project and were not intended to be exhaustive of any of these topics.

Planned Change

Watzlawick, Weakland and Fisch (1974) described two types of change: "first-order change" (where things have only been moved around) and "second-order change" (where a real difference has been made). Methods of effecting second-order change have been investigated as an area of study for about 20 years. The published work of a national conference on planned change held at the University of Michigan in 1973 (Havelock & Havelock, 1973) presented four major perspectives as alternative models for effecting change: a Problem Solving Model, a Social Interaction Model, a Research and Development Model and a Linkage Model. Each of these models focuses on <u>preadoption</u> behavior (awareness, interest, evaluation, trial and adoption), but ignores the issues

of adaptation to an innovative strategy. While a technology or a technological product is usually invariate in its implementation and in its outcome from one context to another, the implementation of an educational innovation is variate. The installation of the former is a mechanical process, while that of the latter is an evolutionary process, or what Berman & McLaughlin (1974) called a "mutation phenomenon." When an educational innovation is implemented, they pointed out, a two-way organizational process of adaptation (mutual adaptation), occurs.

Postadoption behavior of the school is one of the variables affecting student outcomes. Pincus (1974) suggested that project planners should consider the institutional change which any adoption would require.

Berman & McLaughlin (1974) proposed a new three-stage process model for planned educational change, a model which focuses on postadoption rather than preadoption. The three stages are (1) a support stage, (2) an implementation stage, and (3) an incorporation stage.

A considerable amount of literature on planned educational change focuses on adoption and implementation of products of educational R & D activities. Swanson (1976) pointed out that physical products are easily recognized and understood, packaged and transported, whereas, intellectual products may only be recognized and understood by the people who develop and use them. Consequently, intellectual products are more difficult to package and trace.

Several studies have observed that measurable and/or observable changes (impact) which result from R & D activities are cumulative. It has also been observed that the best time to assess impact varies greatly.

Impact Assessment

The review of literature and ideas on assessing the impact of educational R & D activities was intended to help answer the following questions: What is educational impact? How can it be recognized, measured, predicted and facilitated?

What is impact and how can it be measured?

While Dick (1976) defined impact as measurable pheonmena - of positive or negative value - which follow the completion of a project or a program, Miller & Miller (1974) concluded that impact has at least two broad parameters - intended and actual impact. Both studies described similar methods of assessing impact.

Stake (1978) and others concluded that much significant impact in education can be seen but not measured. Impact of an educational project can thus be considered as the measurable and/or observable changes/influences (positive or negative) that are intended, immediate and subsequent. These changes/influences could be both quantitative as well as qualitative, and relate to the process, products, inputs and environment of the educational system to which the project is directed. Thus, impact studies of projects need a chain of assessment at the planning, formative, summative and subsequent stages.

Berman & McLaughlin (1974) stressed that it is necessary for evaluators to have data related to the conditions of the target group before and after the R & D activity. Dick (1976) advocated the use of two evaluators - one internal and one external to the project.

How can impact be measured?

Swanson (1978) listed eight levels at which actual impact may be assessed - where educational impact occurs. These levels are: national, state, regional, local, unit, departmental, classroom and community levels. Some tangible products of impact which may be measured and/or observed at these levels are changes in: capacity for enrollment, actual enrollment, completion, organization, attitudes, efficiency, attendance, status (of minorities), achievement, knowledge, skills, cost, unemployment/underemployment.

Three important strategies for measuring impact were identified by various researchers. O'Boyle (1974) pointed out the need for identifying unique criteria for measuring the impact of certain types of projects. Henning (1975) pointed out that a certain research design has more impact on one kind of project than another research design; this presupposes the choice of an appropriate research design for a given project.

The National Council on Employment Policy (1976) pointed out the need for assessing the duration of impact. They concluded that high initial cost of a project or program may be justified by the impact (gains) which remain constant over time. Thus assessment of actual impact should be divided into "immediate" and

"subsequent" impact. This type of longitudinal impact assessment would require continuity in impact specifications for all state funded projects (Cheney-Stern and Evans, 1979).

How can impact be predicted?

Numerous characteristics which are associated with high versus low impact have been identified by researchers in vocational education and other fields. The degree to which these characteristics are present or absent may be useful in predicting actual impact.

How can impact be facilitated?

Several studies have pointed to the need for research programs to form a coherent whole, a continuity between basic, applied and developmental research. Impact is likely to be facilitated if there is continuity of efforts on the part of researchers, continuity of goals and funding on the part of organizations which fund research, and continuity of reporting successful research results to consumers. Copa (1978) suggested that impact might be facilitated if investment patterns matched the delivery system (i.e. subject-matter rather than "across-the-board" projects).

Case Study Methodology

A case study is "the examination of an instance in action" (Walker, 1974), the purpose of which is to enable the researcher to make generalizations from the instance studied to the class it

purports to represent, to make generalizations from features of the instance to a multiplicity of classes, or to make generalizations about only the instance studied (Adelman, Jenkins and Kemmis, 1975).

A variety of techniques as well as a variety of reporting forms are employed in the case study method.

Stake (1978) distinguished a case study project (the persistent study of a single case) from the multiple case study project (a collection of individual case studies). The latter demands a form of linkage - "a manner in which to discuss their differences and similarities."

The case study literature describes a validation technique called "traningulation" (Center for Instructional Research & Evaluation, 1978), the idea of supporting a controversial issue by at least three independent sources. A controversial finding based on several accounts has more credibility than one based on only one account.

Anonymity of sites and persons and confidentiality of information are among the ethical practices which are common in case studies. These practices provide legal protection to case study researchers as well as privacy to individuals and institutions. Also clearance procedures are often required at the time field contacts are made.

Crawford, Kratochvit and Wright (1972) at the American Institute for Research (AIR) developed criteria for case selection from a variety of eduational R & D activities, and six procedural

steps for multiple case study projects. They also suggested methods of data collection and methods of reporting the collected data.

Other researchers have developed and used special forms for collecting data or series of matrices for analyzing impact. Miller & Miller (1974) compared intended versus actual impact, funding levels and types of problems for over 700 federal and state R & D projects in vocational education.

After identifying and evaluating these and other available mutiple case study procedures and tools, the PROJECT IMPACT staff decided to adopt and adapt some of them for gathering and recording data on their first case studies which were conducted in 1978-79. Details of the methodology and samples of forms used for case nominations and data collection in the 1978-79 investigations are contained in Volume 1. Details of the methodologies and samples of forms used in the 1979-80 investigations are included with the impact studies in volumes 6, 7 and 8.

Chapter 3:

Summaries, Conclusions and Recommendations from the Case Studies

During 1978-79, PROJECT IMPACT analyzed the impact process of four groups of related R & D projects in vocational education (cases) which were funded by the State of Illinois during the past ten years. Two of these cases were tracked from the top-down and two were tracked from the bottom-up. The cases selected for top-down tracking were "The Illinois Occupational Education Project" and "The Illinois Network of Exemplary Occupational Education Programs for Handicapped and Disadvantaged Students". Since these cases targeted primarily on post-secondary administrators and secondary teachers respectively, the project staff decided that selection criteria for the bottom-up cases should be that they targeted on students or teachers and students; also that one of these cases should be a subject-matter specialty rather than an "across the board area". The two cases chosen for bottom-up tracking were "Illinois Projects in Horticulture" and "Illinois Career Education Projects at the Awareness Level". The details of the methods and data collection instruments used for these four case studies are contained in Volume 1.

Case studies added during 1979-80 used case study methods such as document analysis, site visits, interviews and questionnaires but did not involve top-down or bottom-up tracking. These new studies were: an impact assessment of the "Occupational Survival Skills Project" and "Two Illinois School Districts with Innovative Vocational Education Programs". PROJECT IMPACT

also continued to monitor the impact of R & D activities for improving vocational programs for handicapped and disadvantaged students.

In addition to these case studies, a field study "Predicting Impact of R & D Projects in Vocational and Technical Education" was conducted by a research fellow assigned to PROJECT IMPACT in 1979.

Following are summaries of the findings, conclusions and recommendations from each of these impact studies.

The Illinois Occupational Curriculum Project

The Illinois Occupational Curriculum Project (IOCP) was actually a group of related R & D projects which were funded in 1970-74 by the Department of Adult, Vocational and Technical Education. The Research and Development Section sponsored the 1970-72 activities and the Curriculum and Personnel Development Section sponsored the 1973-74 activities of demonstration and initial dissemination. The innovations IOCP introduced were intellectual processes and physical products (resource manuals) for developing occupational programs and courses. Since 1974, the resource manuals have been disseminated through a commercial publisher. The title of the publication is Planning, Implementing and Evaluating Career Preparation Programs (Borgen & Davis, 1974). The groups targeted for impact from IOCP were vocational education administrators from local and state education agencies (LEAs and SEAs).

Local and State funding for IOCP's R & D activities sponsored by the Research and Development Section totaled 227,297 dollars. PROJECT IMPACT was unable to retrieve information on the amount of funding IOCP received from Illinois for demonstration and dissemination workshops. Several other states sponsored similar workshops. Prior to the availability of the commercial publication, the State of Illinois and the IOCP developers disseminated approximately 3,500 sets of the manuals. According to the publisher's records for 1974-1979, an additional 1,758 were disseminated throughout nearly every state and territory of the United States.

In developing procedures to assess IOCP's impact within five years after State funding of the project was terminated, PROJECT IMPACT limited its investigation to an intended impact on an intended target group--to improve the curriculum development practices of the approximately 500 vocational education administrators who attended the IOCP workshops in Illinois. Such retrospective assessments have usually failed to show impact because efforts to retrieve project proposals and reports were unsuccessful. IOCP documents were identified from concise listings in IOCP reports. Documents were retrieved from a variety of sources such as DAVTE, IOCP staff, IOCP consultants and the ERIC collection. Thorough document analysis paid-off in finding baseline data on 1971 curriculum development practices in Illinois community colleges. These 1971 data verified the underlying assumptions of IOCP and pinpointed practices which needed the most improvement. Assessment of IOCP's impact was facilitated

by our being able to replicate the 1971 survey in 1979. We found that many curriculum development practices changed (improved) from 1971 to 1979 and that many of these changes were significant at the .05 level. Because of the impossibility of controlling intervening variables, these changes can not be entirely attributed to IOCP. However, IOCP was a major treatment variable during this time in Illinois and we feel confident in saying that it did achieve its intended impact on an intended target population. The IOCP case study demonstrated the value of funding a research project to thoroughly investigate a problem and gather baseline data. It also demonstrated the value of maintaining files for documents on completed projects. A pitfall common to impact assessment which IOCP did experience was neglecting to obtain complete names and addresses on workshop rosters. Other characteristics of IOCP which may bear on its impact are:

- The proposal for the project was in response to a felt need at the local level and not in response to a Request for a Proposal (RFP) from an official funding agency.
- The project's developers and their institution had good track records in R & D activities.
- The project was thoroughly planned and the felt need for the project was verified with baseline data on the group and the behaviors targeted for impact.
- The processes and products of the project were carefully developed, pilot-tested, field-tested and continually evaluated.

- The project had continuity in funding and in staff.
- The project hired external evaluators as consultants.

The Illinois Network of Exemplary Occupational Education Programs for Handicapped and Disadvantaged Students (The Network)

PROJECT IMPACT's top-down tracking of the Network began in FY 79--the last year that the Network received R & D funds. Tracking was continued during FY 80 to assess the impact of discontinued funding on the overall impact of the Network. The Network was funded by the IOE/DAVTE for four years at a total cost of 1.6 million dollars. The purpose of the Network was to expand the quality and quantity of special needs vocational education in the State of Illinois. Originally the Network was comprised of nine sites. One of the sites was centrally located and was devoted to dissemination and coordination of the Network's efforts. Other sites which existed throughout the state consisted of one community college, one area vocational center and six comprehenesive high schools. In addition to providing Illinois educators with accessible programs for on-site viewing, the Network also served as a source of materials, processes, consulting services and in-service training appropriate for providing vocational education for students with special needs.

At the inception of the Network in 1975, the variability of program and process development at all sites reflected the individual problems and available resources within the site district. The

categories of the products developed were: administration, community resources, curriculum, support services, inservice, special techniques, special programs and individualized planning. There was reluctance at the central dissemination site to push for use of Network products because there were no data on the effectiveness of most of the materials. Very few products were formally field tested within the Network. Consequently, materials developed elsewhere were adopted, adapted and disseminated by the Network.

Processes of evaluation which proved to have been important to the Network were: internal evaluation at each site, third-party (external) evaluation at each site, and the annual submission of a continuation proposal and final report.

During its third and fourth years, the Network's emphasis was on State-wide diffusion of mainstreaming materials. One highlight of the 1977-78 school year dissemination activities was a two-day, state-wide conference held in Decatur during November 1977. Over 200 educators from Illinois attended the conference. Other states were also represented.

Also during the 1977-78 school year, the Network printed and disseminated booklets which described Network activities by site. Conference and workshop presentations in the state and nationally at the annual meeting of the American Vocational Association, and quarterly newsletters on special needs vocational education were among the additional 1977-78 school year dissemination activities. Similar state-wide conferences and one-day work-

shops were held during the 1978-79 school year and were well attended.

The Network enjoyed a high level of visibility both within Illinois and, to a certain extent, nationally among educators interested in special needs vocational education. A perusal of workshop evaluation forms and letters requesting information on file at the Illinois State University dissemination site bears witness to the Network's ability to reach many educators. In qualitative terms, there is little doubt that the Network achieved the impacts of increased awareness and increased acceptance of the need for mainstreaming special needs students in vocational programs. In 1979, PROJECT IMPACT recommended that the Network collect quantitative baseline and follow-up data on these intended impacts and that both the Network and PROJECT IMPACT should attempt to collect qualitative and quantitative data on increasing enrollments of special needs students in vocational programs.

In FY 80, PROJECT IMPACT continued to monitor the progress of the Network sites and specifically examined the impact of discontinued funding. A follow-up questionnaire was mailed to the former project directors and principal staff members at each of the Network sites. In addition, two interview sessions were held with these individuals in May 1980 to further explore and document Network activities during 1979-80. This follow-up study focused on three major questions: (1) To what extent have the programs and services for special needs students been expanded, maintained, or reduced? (2) How have staffing and student

enrollment patterns changed? (3) To what extent does each district (Network site) continue to provide inservice and assistance to others?

The major observations noted in the 1979-80 follow-up impact study were as follows:

1. In all cases the H & D Network funding had led to the enhancement and expansion of special needs programs and support services for special needs students within the funded districts.
2. With only one exception, the programs and services established with the project funding had been maintained during 1979-80 at the seven sites participating in the follow-up study.
3. Generally, the sites reporting in the follow-up study indicated that the number of handicapped and disadvantaged students served in vocational education programs had increased over previous years.
4. During 1979-80 the Network sites reported several instances of communication with other districts for the purpose of adopting or adapting programming models developed at the Network site.
5. The success of efforts to continue working with selected "satellite sites" appeared to have varied results. Three Network sites had continued to be extensively involved with their satellite sites in 1979-80.

6. As a result of substantial staff turnover several Network sites reported a continuing need for inservice staff development activities within their own districts.

Some characteristics of the Network which may bear on its impact are:

- The project was in response to Federal legislation rather than a felt need at the local level
- The project staff members were not experienced in R & D activities
- There was a high rate of staff turnover at several of the Network sites
- The project did not collect baseline data on its target groups to verify its assumptions about them
- The project did not formally field test its products
- The project was externally as well as internally evaluated
- The project had continuity in funding
- The project did not formally collect pre or post data on workshop participants in terms of their attitudes, knowledge or skills.

In reflecting on assessing the impact of the Network, PROJECT IMPACT concluded that trial use of the State's data bank might be worthwhile. For example, the numbers of H & D enrollments claimed for reimbursements by the vocational programs at the nine Network sites could be compared for 1975 (the year the Network began) and 1980-84 (the five-year period from the time the Network's funding was terminated). If enrollment data

from nine comparable sites could be collected for the same years, the two sets of data could be compared to see if the experimental sites have had greater increases in H & D enrollments in vocational programs.

Illinois Projects in Horticulture

The horticulture case study was an attempt to develop procedures for assessing the impact of a group of many (but small) related projects. Unlike the IOCP and Network case studies which were conducted from the top-down (developers of products to users of products), the horticulture case study was from the bottom-up (intended users to developers). Fourteen projects costing about $200,000 over ten years were identified. A case researcher familiarized himself with as many of the R & D products he could find from these projects. However, PROJECT IMPACT's "bottom-up" scheme was compromised when the case researcher was unable to find many of the products and had to go to the developers for assistance. Use of these products was then looked for in a sample of horticulture programs in Illinois. One of the major findings of this investigation was that users were often unaware of the origins of the products they were using. Parts of many products were found to have been passed down through the ranks of "hort" teachers (this was found to be the case with administrators in the IOCP case study too). It was also learned that most "hort" teachers are "ag" teachers and that "ag" teachers have an annual turnover rate of 10 percent or more. It was conluded that good "hort" products (or revisions of

good products) need to be re-disseminated every few years. The information on turnover rates raised the question, "What is known about turnover rates for teachers in other vo-tech areas?" It was also learned that the "hort" teachers heard about instructional materials and workshops through established communciation channels with colleges of agriculture rather than through educational R & D linkages. The numbers of horticulture programs, teachers and students in Illinois were found to have increased greatly during the 10-year span of R & D projects analyzed. Had the characteristics of "hort" teachers been known and utilized, dissemination practices would have (no doubt) differed and the impact of these related projects would (no doubt) have been greater. The major conclusions of this case study were that bottom-up researching was valuable in revealing and/or verifying characteristics of teachers which were relevant to facilitating impact. It was also learned that one procedure an impact study should not rely on is: asking teachers if they do or do not know about (or use) a certain product. In many instances they are using it and don't know it.

Some characteristics of the horticulture projects which may bear on their impact are:

- The origins of projects came from suggestions at meetings and RFPs. There was no planned program of projects until the last few years.
- Most projects were narrow in scope.
- Most projects were low-cost, low-risk.

- Most products developed by projects were not formally field-tested and revised before being disseminated.
- Most products developed by projects were not widely disseminated.
- Projects did not study the characteristics of their intended target groups.

Illinois Career Education Projects at the Awareness Level

"Career Awareness" projects for grade-school children and for incarcerated adults constituted this bottom-up case study. Findings are summarized for each group--elementary school populations a[illegible]rison populations.

Elementary School Populations

PROJECT IMPACT identified three major career awareness projects for children which were funded by the State of Illinois during the Seventies. These projects were: The Career Development Project for Children (CDCP), Project ABLE and Project OCCUPACS. A case researcher familiarized himself with the products of these projects and then set out to see to what extent the products were being used by elementary level school teachers in Illinois. Because of the large size of this teacher group, PROJECT IMPACT decided to arbitrarily look in depth at a few districts (large, medium and small) rather than to draw a random-sample of elementary teachers for the entire State. Based upon this very small sample, PROJECT IMPACT found that elementary

teachers were presenting career awareness content but were using very old (or no) instructional materials. The teachers in the sample were not using any of the products of these three major projects. Furthermore, none of these teachers had even heard of the projects or their products. Obviously, the sheer size of this group of teachers in Illinois and throughout the nation calls for special dissemination considerations.

At this point in the case study, PROJECT IMPACT decided to continue the bottom-up tracking of only one of the three projects for children--the Career Development for Children Project (CDCP). The CDCP was funded February 1970 - August 1973 at a cost of $272,786. It was funded just prior to USOE's big push for career education, and it impacted at the national level before it ever reached its original intended target group of classroom teachers. From this case study, PROJECT IMPACT become aware of the need to monitor changes of the group(s) intended for impact. Otherwise, in efforts to assess the specified impact at the peak time, one may end up looking at the wrong group.

Because of the national interest in CDCP, the State made a decision to solicit bids from commercial publishers for the dissemination of CDCP. Only one bid was received and it was from an established firm that had experience with teachers of industrial arts and technical career subjects but not teachers of children in the elementary grades. It seems that the State, the publishers of CDCP and PROJECT IMPACT have all been niave about the consequences of entering new turf! Certainly, more thorough investigations of new intended target groups are required in order to facilitate the impact upon them.

In the days since tracking of CDCP was completed, PROJECT IMPACT's staff members have continued to ponder and investigate ways of assessing the impacts of the investments in career education during the last decade and ways to facilitate impacts not yet realized from these investments. Two possible means have emerged to date. At the beginning of the decade and at the end of the decade, the United States Department of Labor funded National Longitudinal Surveys of the labor force. In both surveys, thousands of young men and young women were interviewed about their knowledge of specific careers. The interview questions were nearly identical for each randomly selected sample in each survey. If the average scores from the first NLS were compared to scores from the second NLS, it would provide a measure of the impact of career education. It might be possible to obtain sub-sets of scores for Illinois youth in the samples and thereby make additional comparisons.

During the past year PROJECT IMPACT has studied various types of annual reports done by vocational programs in the State. One of the formats used by Area Vocational Centers (AVCs) is to show the total number of enrollees for each participating school district and then to show what proportion of each district's high school population that figure represents. In reviewing several annual reports of this nature from the same AVC it was learned that there had been steady increases in the proportions of high school students who enrolled at the AVC. If these types of data were compiled from all the AVCs' annual reports to the State, it

would seem to be another good measure of career education's impact.

In contemplating pay offs from past as well as future investments in career education, it seems that a large number of career education materials have been well planned and well developed but poorly disseminated. As more is learned about dissemination and utilization, it seems that it might be more worthwhile to revise and/or reprint some of the materials already developed than to invest in the planning and development of additional career education materials.

Prison Populations

In the past, most evaluations of correctional programs have been long-term and most of these have reported impact in terms of recidivism. Recently, however, researchers in correctional education have concluded that if research and evaluation of correctional career education are to pay off, criteria other than program effects on recidivism must be established. They would like to see more immediate (formative) evaluations of the impacts of components of career education programs. PROJECT IMPACT retrieved such data while investigating the Career Orientation and Awareness Program (COAP).

COAP is an experimental prevocational project for prisoners which was first funded by CETA in 1975 at a cost of approximately $85,000 a year. One of the intended impacts of COAP is to facilitate vocational maturation of recently incarcerated young men. One of COAP's assumptions is that if prisoners develop a

more accurate self-concept, they will make better decisions about choosing a career and preparing for it.

Among the evaluations of COAP was an impact study to see if the experimental program increased the accuracy of prisoners' self-concepts in terms of vocational abilities and vocational needs (Cheney-Stern, 1977). A 1976 student group and a comparable non-student group of prisoners were tested before and after COAP. It was found that both groups' estimates became more accurate but that some of the gains for the student group were significantly greater.

Other data on actual and prospective COAP students which were collected and analyzed provided some insights into facilitating rather than assessing impact. When prisoners' profiles of vocational needs were compared to reinforcer profiles of occupations, it was found that many goods-servicing and selling occupations were most likely to satisfy the prisoners but that many construction and manufacturing occupations were not (Cheney-Stern, 1978). A list of the occupations which were most likely to satisfy the (actual and prospective) COAP group was then compiled and compared to a list of occupations which prisoners (in an earlier study of essentially the same population by Galloway in 1972) had indicated the most interest in receiving training. The occupations of highest interest (auto mechanic, construction trades and heavy-equipment operator) were among those least likely to satisfy. This finding would seem to indicate that programs based upon prisoners' inventoried needs would differ

markedly from programs based upon prisoners' expressed interests. Would feedback on standardized tests (inventories) of abilities and needs re-direct prisoners interests? And would correctional (or regular) vocational programs based upon student and manpower needs be more successful than ones based on student interests and manpower needs?

In addition to looking at Illinois-funded career awareness projects, PROJECT IMPACT reviewed numerous abstracts of evaluative studies on career awareness (prevocational) programs. Although a tally was not kept, it seemed that few courses or programs of less than 80 hours had any impact. Courses or programs of 80 hours or more were much more likely to produce a significant difference--especially if learning activities included hands-on experiences. During its first year (1976), COAP was an 80-hour course which did include some hands-on activities. PROJECT IMPACT concluded that characteristics associated with impact of career education programs deserve further investigation so that the knowledge gained can be incorporated into curriculum guidelines or standards for career education programs at orientation, awareness and exploratory levels.

The Occupational Survival Skills Project

The Occupational Survival Skills (OSS) project was funded by the State from 1978 through 1980 at a total cost of about $90,300. Instead of tracking the OSS project from the top-down or bottom-up, PROJECT IMPACT decided to involve former OSS staff in assessing the impact of their own project. By this point

in time, OSS was one of the selected projects to be disseminated nationally by the National Center for Vocational Education Research. Documentation of nation-wide impact of OSS was largely accomplished by retrieving and reviewing files of correspondence. Fortunately, these files were still being retained by the developers of the OSS project. Many qualitative statements from OSS users (teachers and students) in various types of learning situations were compiled from the files and presented in PROJECT IMPACT's case study.

In retrospect, it seems that such efforts and such results are in perfect compliance with P.L. 94-482. To go beyond this level of data collection is not required by law. However, many impact researchers have concluded that impact assessments should include quantitative data which show that a measurable difference has or has not been made within a given time frame of the introduction of an innovation into the educational system.

Types of quantitative data which were mentioned but not measured in the OSS Case study were factors such as decreased rates in students dropping out of school and decreased rates in students leaving (or being asked to leave) their training stations in cooperative vocational education programs. Certainly, it should be possible to obtain such data for schools using OSS and comparable schools not using OSS. However, if comparisons were made and differences were found, it would be difficult to attribute these differences to the use or non-use of OSS materials because of other possible treatment or intervening variables which were operating at the same time. Nevertheless, the comparative

data could be useful in making judgments about the impact of the OSS project.

One of the OSS staff members who participated in PROJECT IMPACT's study of OSS stated that if the OSS staff had known they were to conduct an impact assessment on themselves, they would have been more formalistic with the testimonial data they received about OSS. For example, they would have solicited testimonials by providing a tear-out, fill-out and send-back evaluation sheet in every volume of OSS materials disseminated.

Two School Districts with Innovative Vocational Education Programs

During PROJECT IMPACT's second year of activities a decision was made to study the process of vocational educations impact by examining two Illinois communities where the school districts' vocational programs were considered to be the best in the State.

To guide these community studies, a set of questions having to do with five major educational issue areas was developed. These five issue areas were: sex equity, special needs students, career education, basic skills, and entrepreneurship (self-employment).

The initial phases of these two case studies focused on developing a comprehensive view of the communities, the schools and the vocational education programs. Extensive interviews were conducted with citizens in each of the communities representing: business, industry, labor, governmental agencies, local news

media, parents of school-age children, and various civic groups. In addition, numerous school personnel, including school board members, administrators, staff and students were interviewed at both locations. Numerous documents describing the communities, schools, and vocational education programs were also obtained and analyzed. Finally, two surveys were conducted to assess the perceptions of community members and school personnel regarding needed program improvements for their vocational education programs.

Each of the communities and programs studied have numerous unique characteristics which necessitated a careful examination of the programs on an individual basis. Each program appears to be well-tuned and responsive to community, economic needs, as well as the career interests and needs of students and parents at the secondary level. Various hypotheses were posited and discussed in an attempt to describe the reasons for the existence of effective vocational programs. These hypotheses include the notion that selected administrators, with a background in vocational education and, holding extended tenure in the community may be the reason for a successful program. Another major hypothesis discussed the homogeneity of community values. One of the programs studied operates quite effectively in a small, rural, agricultural community where the cultural values seem to be homogeneous and highly consistent with the objectives of vocational education. Another hypotheses postulated a high positive correlation with the quality of the instructional staff for the

vocational education program. A fourth hypothesis noted a possible relationship to the perceived value of vocational education programs as held by academic teachers and counselors. As vocational education continues to look at its impact upon a community, a large number of reasons can be cited for it's effectiveness or ineffectiveness. More comprehensive methods and strategies for conducting in-depth analyses of vocational education in a community setting are clearly needed. Future research should focus on helping vocational educators develop or adapt tools for collecting and using ethnographic data and information. Such tools would be extremely helpful in helping to better understand how vocational education works for (impacts upon) individual communities and students.

The community members and school personnel were surveyed to determine their perceptions of how well the vocational education programs responded to each of the major issues or problems. Across both communities it appeared that a major concern existed relative to the role of vocational education in improving the basic skills (writing, reading, and communication) of high school graduates. All groups felt this was the most important issue for vocational education to address in a more effective manner in the future. The least important issue for future focus, from among the five listed in the survey, was self-employment or entrepreneurship skills.

Predicting Impact of R & D Projects

A research fellow assigned to PROJECT IMPACT for the first seven months of 1979 investigated project characteristics considered to be most important in the success of "research" versus

"development" versus "research and development" activities in vocational and technical education. Findings from the study indicate that most characteristics which are important to success of "research" are also important to the success of "development" or "research and development" activities. As a result of the investigation and discussions with State staff, PROJECT IMPACT concluded that decisions about funding projects and the impact of the projects funded would be facilitated if funding proposals were evaluated on a form for rating the extent to which important characteristics of a project are present at the time of funding. Such an instrument was developed but not pilot tested by PROJECT IMPACT. Use of such a rating form may be further investigated by PROJECT IMPACT and the Research and Development Section of DAVTE during FY 81.

Chapter 4:

Generalizations and Guidelines Regarding the Impact of R & D Activities in Education

Literature reviews, discussions and case studies have helped PROJECT IMPACT's staff to draw some generalizations and guidelines regarding the impact of R & D activities in education. These are:

1. Research programs should have a coherent whole in order to have impact. There should be continuity between basic, applied and developmental research.
2. Impacts are measurable and/or observable changes in specific conditions and/or behaviors of specific populations.
3. Impacts are cumulative and the best times to assess them vary greatly. Some impacts are immediate and some are subsequent. Some are sustained and some are not.
4. Impact and its assessment are facilitated to the extent that formative evaluation is carried out and that baseline data on conditions and behaviors of target groups are available.
5. An external (as well as an internal) evaluator should be employed throughout a project (or program of related projects).
6. Intended impacts and/or populations targeted for impact frequently change during the life of R & D projects. Therefore, impact specifications need to be revised and monitored throughout a project.

7. Retrospective assessment of impact should not be attempted unless planning papers and progress reports are available for thorough document analysis.
8. The adoption process is different for a technological product (e.g. a calculator) than for an educational innovation (e.g. a new math curriculum). Educational R & D products may be physical or intellectual. Physical products are easily recognized, understood, packaged and transported. Intellectual products may only be recognized and understood by the people who develop and use them and they are more difficult to package and trace.
9. Planned educational change should focus on the school's postadoption behaviors (support, implementation and incorporation) rather than its preadoption behaviors (awareness, interest, evaluation, trial and adoption).

Some of PROJECT IMPACT's conclusions and recommendations have resulted in guidelines which pertain more to directors of R & D projects and some which pertain more to funding agencies.

Guidelines for Project Directors

1. Design a research program of linked projects where a problem is identified and clarified before a solution to it is developed, tested and disseminated.
2. Employ an external evaluator who can examine raw data for accuracy, report to the funding agency, hold discussions with staff and/or the target population, help

identify problems and informally offer alternative solutions.

3. Specify intended and actual impacts in qualitative (observable) and/or quantitative (measurable) terms and revise them as necessary.
4. Specify the population(s) to be impacted and revise these specifications as necessary.
5. Specify the methods and tools to be used for assessing baseline data in the problem-identification stage of a project.
6. Suggest methods and tools to be used for observing or measuring changes from baseline levels.
7. Estimate the time frame for peak impact.
8. Maintain a record of previous research which is used as a resource. A concise listing of published and unpublished resources helps to document the impact of basic research on applied research.

Guidelines for Funding Agencies

1. Fund projects which are part of a coherent whole or which can be expected to be part of a future set of projects.
2. Maintain archives of project documents such as planning papers, proposals, progress reports and final reports.
3. Develop an impact specification format which can be coded for storage and retrieval on computers or microforms.

4. Require impact specifications for each project (or program of linked projects). This can (and probably should) be done at the RFP stage. Writers of unsolicited proposals should prepare their own specifications.
5. Require baseline data of each R & D project (or program of linked projects). If these data are not in the RFP or the proposal, require collection of them as a funded activity.
6. Monitor impact specifications/revisions throughout the life of a project (or program of linked projects).
7. Assess the impacts of major completed projects in accordance with the baseline data and estimates of peak impact given by the former project directors.

In order to apply these generalizations and guidelines for achieving impact and assessing it, PROJECT IMPACT has worked with the Research and Development Section (RDS) to develop an "implementable model" of an impact assessment system. Step-by-step procedures have been developed and are to be refined and installed over the next fiscal year. These procedures are summarized in a flow chart. (See Fig. 1).

. These procedures will be reviewed and refined with the staff members who will be implementing the impact assessment system over the next fiscal year. Once the system is installed, procedures 1 and 2 may be omitted for as long as the classification system and criteria for ultimate impacts are found to be satisfactory. In a separate document, each step is described in narrative

form and has an activity sheet to go with it which specifies responsibilities, decision criteria and resources for personnel.*

*Proposed procedures for installing an impact assessment system for the Research and Development Section of the Illinois Board of Education, Department of Adult, Vocational and Technical Education. Unpublished manuscript prepared by PROJECT IMPACT, July, 1980.

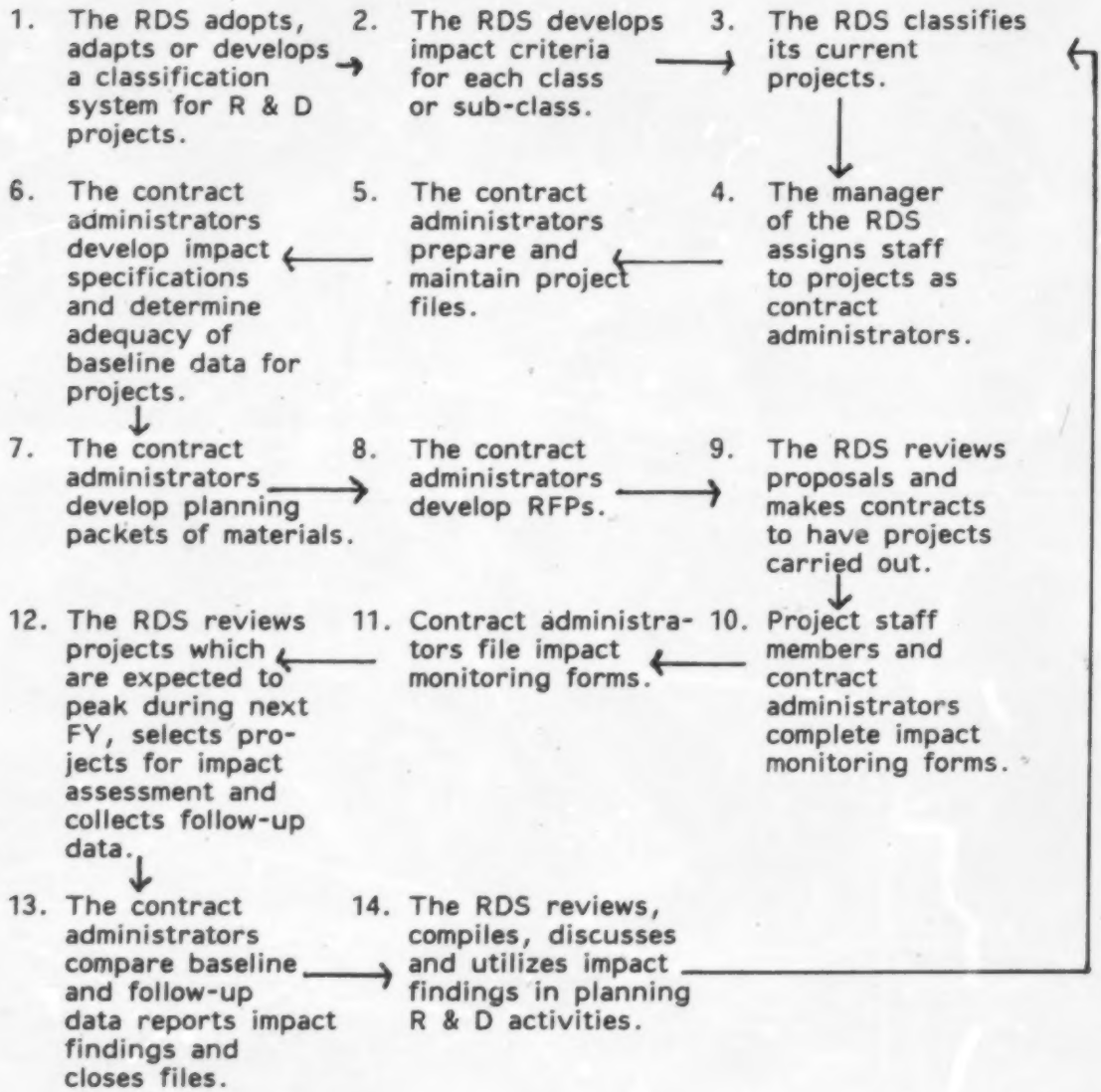
1. The RDS adopts, adapts or develops a classification system for R & D projects.
2. The RDS develops impact criteria for each class or sub-class.
3. The RDS classifies its current projects.
4. The manager of the RDS assigns staff to projects as contract administrators.
5. The contract administrators prepare and maintain project files.
6. The contract administrators develop impact specifications and determine adequacy of baseline data for projects.
7. The contract administrators develop planning packets of materials.
8. The contract administrators develop RFPs.
9. The RDS reviews proposals and makes contracts to have projects carried out.
10. Project staff members and contract administrators complete impact monitoring forms.
11. Contract administrators file impact monitoring forms.
12. The RDS reviews projects which are expected to peak during next FY, selects projects for impact assessment and collects follow-up data.
13. The contract administrators compare baseline and follow-up data reports impact findings and closes files.
14. The RDS reviews, compiles, discusses and utilizes impact findings in planning R & D activities.

Fig. 1 An Impact Assessment System for a Research and Development Section (RDS)

As the Research and Development Section and PROJECT IMPACT work together to refine and implement an impact assessment system, they will attempt to identify further guidelines for facilitating the impact of R & D activities. It is anticipated that these efforts will result in a "handbook" for achieving and assessing R & D impact.

A concise listing of the major references used for these impact studies are contained in Volume 1 of this report.